CLAIMS

1. A device for detecting a road traveling lane, from images on a road surface continuously picked up by image pickup means, comprising:

edge point detection means for detecting a plurality of edge points in a contour on the image;

edge histogram producing means for producing a vertical edge histogram for horizontal elements of the plurality of edge points detected by said edge point detection means;

block marking line determination means for determining presence and absence of a block-like marking line on the basis of periodicity of distribution and a combination of distributions of plus edges and minus edges in the vertical edge histogram produced by said edge histogram producing means, and defining a region where said block-like marking line is present;

lane boundary edge detection means for detecting vertical edge points present outside of a center of said traveling lane, in the region where said block-like marking line defined by said block marking line determination means is present; and

lane boundary position defining means for defining a position of a curve fitted to the vertical edge points detected by said lane boundary edge detection means, as a position of a boundary of said traveling lane.

2. A device for detecting a road traveling lane as described

in claim 1, wherein said edge point detection means detects the plurality of edge points on the image picked up by said image pickup means, and makes a reverse projection of coordinate data of the plurality of edge points on a 3-dimensional road surface coordinate, to produce said plurality of edge points.

3. A device for detecting a road traveling lane as described in claim 1, wherein said lane boundary edge detection means detects the edges of the lane boundary in an interval between neighboring block lines, on the basis of such a relationship that a vertical region between a peak of a plus edge histogram and a peak of a minus edge histogram corresponds to the interval between neighboring block lines, in said vertical edge histogram produced by said edge histogram producing means.

4. A device for detecting a road traveling lane as described in claim 1, wherein said lane boundary position defining means applies a curve including a plurality of straight lines to the vertical edge points detected by said lane boundary edge detection means, to achieve a curve-fitting.

5. A device for detecting a road traveling lane as described in claim 4, wherein said lane boundary position defining means achieves said curve-fitting by means of one of RANSAC, Hough conversion and least square method.

6. A device for detecting a road traveling lane, from images on a road surface continuously picked up by image pickup means, comprising:

edge point detection means for detecting a plurality of edge points from a contour on the image;

edge histogram producing means for producing a horizontal edge histogram for vertical elements of the plurality of edge points detected by said edge point detection means;

block marking line determination means for determining presence and absence of a block-like marking line on the basis of periodicity of distribution and a combination of distributions of plus edges and minus edges in the horizontal edge histogram produced by said edge histogram producing means, and defining a region where said block-like marking line is present;

lane boundary edge detection means for detecting vertical edge points present outside of a center of said traveling lane, in the region where said block-like marking line defined by said block marking line determination means is present; and

lane boundary position defining means for defining a position of a curve fitted to the vertical edge points detected by said lane boundary edge detection means, as a position of a boundary of said traveling lane.

7. A device for detecting a road traveling lane as described in claim 6, wherein said edge point detection means detects the plurality of edge points on the image picked up by said image pickup means, and makes a reverse projection of coordinate data of the plurality of edge points on a 3-dimensional road surface coordinate, to produce said

plurality of edge points.

8. A device for detecting a road traveling lane as described in claim 6, wherein said lane boundary position defining means applies a curve including a plurality of straight lines to the vertical edge points detected by said lane boundary edge detection means, to achieve a curve-fitting.

9. A device for detecting a road traveling lane as described in claim 8, wherein said lane boundary position defining means achieves said curve-fitting by means of one of RANSAC, Hough conversion and least square method.

10. A device for detecting a road traveling lane, from images continuously picked up on the road by image pickup means, comprising:

edge point detection means for detecting a plurality of edge points in a contour on the image;

vertical edge histogram producing means for producing a vertical edge histogram for horizontal elements of the plurality of edge points detected by said edge point detection means;

block marking line determination means for determining presence and absence of a block-like marking line on the basis of periodicity of distribution and a combination of distributions of plus edges and minus edges in the vertical edge histogram produced by said vertical edge histogram producing means;

horizontal edge histogram producing means for producing a horizontal edge histogram for vertical elements of the

plurality of edge points detected by said edge point detection means; and

lane boundary position defining means for determining a plurality of vertical edge points, whose vertical edge histogram varies periodically in response to traveling of said vehicle, and which were determined to be closest to a center of said traveling lane on the basis of the horizontal edge histogram produced by said horizontal edge histogram producing means, and defining a position of a curve fitted to the plurality of edge points present outside of the center of said traveling lane, as a position of a boundary of said traveling lane.

11. A device for detecting a road traveling lane as described in claim 10, wherein said edge point detection means detects the plurality of edge points on the image picked up by said image pickup means, and makes a reverse projection of coordinate data of the plurality of edge points on a 3-dimensional road surface coordinate, to produce said plurality of edge points.

12. A device for detecting a road traveling lane as described in claim 10, wherein said lane boundary position defining means applies a curve including a plurality of straight lines to the vertical edge points detected by said lane boundary edge detection means, to achieve a curve-fitting.

13. A device for detecting a road traveling lane as described in claim 12, wherein said lane boundary position

defining means achieves said curve-fitting by means of one of RANSAC, Hough conversion and least square method.